

-36-

WHAT IS CLAIMED IS:

1. A process for preparing extracts from solid plant materials, wherein the plant materials comprise tropolones, lignins and polar molecules, the process comprising:
 - a) mixing the plant materials with a liquid polar solvent to form an extraction mixture;
 - b) maintaining said extraction mixture under extraction conditions effective to extract a proportion of the lignins, a proportion of the polar molecules and at least 50% of the tropolones in the plant materials into said polar solvent to form a pregnant polar solvent liquid phase, and a solid phase of extracted plant materials in said extraction mixture;
 - c) separating said pregnant polar solvent liquid phase from said solid plant materials;
 - d) mixing said pregnant polar solvent liquid phase with a substantially immiscible nonpolar solvent under partition conditions effective to partition the tropolones and lignins substantially into said nonpolar solvent and to partition the polar molecules substantially into said polar solvent, to form a partitioned nonpolar solvent phase comprising lignins and tropolones, and a partitioned polar solvent phase comprising the polar molecules; and
 - e) separating said partitioned polar solvent phase from said partitioned nonpolar solvent phase to obtain a polar plant extract and a nonpolar plant extract.
2. A process for preparing extracts from solid plant materials, wherein the plant materials comprise tropolones, lignins and plicatic acid, the process comprising:
 - a) mixing the plant materials with a liquid polar solvent to form an extraction mixture;
 - b) maintaining said extraction mixture under extraction conditions effective to extract a proportion of the plicatic acid, a proportion of the lignins and at least 50% of the tropolones in the plant materials into said polar solvent to form a pregnant polar solvent liquid phase, and a solid phase of extracted plant materials in said extraction mixture;
 - c) separating said pregnant polar solvent liquid phase from said solid plant materials;

-37-

- d) mixing said pregnant polar solvent liquid phase with a substantially immiscible nonpolar solvent under partition conditions effective to partition the tropolones and the lignins substantially into said nonpolar solvent and to partition the plicatic acid substantially into said polar solvent, to form a partitioned nonpolar solvent phase comprising lignins and tropolones, and a partitioned polar solvent phase comprising plicatic acid; and
- e) separating said partitioned polar solvent phase from said partitioned nonpolar solvent phase to obtain a polar plant extract and a nonpolar plant extract.

3. The process of claim 1 or 2 further comprising concentrating the partitioned polar solvent phase and the partitioned nonpolar solvent phase by removing the polar and the nonpolar solvents respectively to form a concentrated polar phase and a concentrated nonpolar phase.

4. The process of claim 3 wherein said polar solvent and said nonpolar solvent are removed by distillation.

5. The process of claim 3 wherein said polar solvent and said nonpolar solvent are removed using solid phase separation.

6. The process of claim 3 or 4 further comprising treating said concentrated nonpolar plant extract with an additional wash of nonpolar solvent effective to partition lignins and tropolones into a lignin extract and a tropolone extract.

7. The process of claim 6 wherein said additional wash of nonpolar solvent is comprised of diethyl ether.

8. The process of any one of claims 1-7 wherein said solid plant materials are derived from a plant species selected from the plant order Cupressales.

9. The process of claim 8 wherein said plant species is selected from the group consisting of: *Thuja plicata* Don., *Cupressus arizonica*, *Cupressus macnabiana*, *Juniperus monosperma*, *Chamaecyparis thyoides*, *Thujopsis dolabrata* var. *hondae* and *Thuja occidentalis*.

-38-

10. The process of claim 9 wherein said plant species is *Thuja plicata* Don.
11. The process of any one of claims 8-10 wherein the solid plant materials are derived from the trunk or branches of said plant species.
12. The process of any one of claims 1-11 wherein said polar solvent is a liquid solvent having a polarity index of at least 4.
13. The process of any one of claims 1-12 wherein said polar solvent is selected from the group consisting of: 2-methyl-1-propanol; methyl isoamyl ketone; n-butyl acetate; methyl isobutyl ketone; tetrahydrofuran; 2,6-lutidine; ethyl acetate; isopropanol; chloroform; cyclohexanone; methyl ethyl ketone; methyl n-propyl ketone; 2-picoline; dioxane; ethanol; nitroethane; pyridine; acetone; methoxyethanol; acetic acid; acetonitrile; methanol; nitromethane; m-cresol; and water.
14. The process of any one of claims 1-13 wherein said polar solvent is methanol.
15. The process of any one of claims 1-14 wherein said nonpolar solvent is a liquid solvent having a polarity index less than 4.
16. The process of any one of claims 1-15 wherein said nonpolar solvent is selected from the group consisting of: squalane; isooctane; n-decane; 1,1,2-trichlorotrifluoroethane; cyclohexane; n-hexane; pentane; cyclopentane; heptane; petroleum ether; carbon disulfide; n-butyl chloride; carbon tetrachloride; dibutyl ether; triethylamine; diisopropyl ether; toluene; o-xylene; p-xylene; methyl t-butyl ether; bromobenzene; chlorobenzene; iodobenzene; o-dichlorobenzene; diethyl ether; benzene; dichloromethane; ethyl bromide; fluorobenzene; ethylene dichloride; isopentanol; ethylene chloride; 2-propanol; n-butanol; n-propanol; and tert.-butanol.
17. The process of any one of claims 1-16 wherein said nonpolar solvent is dichloromethane.
18. The process of any one of claims 1-17 wherein said nonpolar solvent is diethyl ether.

-39-

19. The process of any one of claims 1-18 wherein said extraction conditions are maintained for an extraction period of from about one minute to three days.
20. The process of claim 19 wherein said extraction period is about one to 24 hours.
21. The process of claim 20 wherein said extraction period is about 24 hours.
22. The process of claim 21 wherein said extraction period is about 12 hours.
23. The process of claim 22 wherein said extraction period is about six hours.
24. The process of any one of claims 1-23 wherein said extraction conditions are repeated one or more times.
25. The polar plant extract prepared by the process of any one of claims 1-24.
26. The nonpolar plant extract prepared by the process of any one of claims 1-24.
27. The extracted plant materials prepared by the process of any one of claims 1-24.
28. A plastic-forming material derived from the polar plant extract of claim 25.
29. The use of the polar plant extract of claim 25 in the manufacture of plastics.
30. A preservative composition comprising the nonpolar extract of claim 26.
31. An antioxidant composition comprising the nonpolar extract of claim 26.
32. A fragrance ingredient comprising the nonpolar extract of claim 26.
33. A cleansing agent comprising the nonpolar extract of claim 26.
34. A disinfecting composition comprising the nonpolar extract of claim 26.

-40-

35. The use of the nonpolar extract of claim 26 in the manufacture of a medicament for treating infection.
36. The use of the nonpolar extract of claim 26 in the manufacture of a disinfectant.
37. The use of the nonpolar extract of claim 26 in the manufacture of a fragrance.
38. The use of the nonpolar extract of claim 26 in the manufacture of an antibacterial agent.
39. The use of the nonpolar extract of claim 26 in the manufacture of an anticancer agent.
40. The use of the nonpolar extract of claim 26 in the manufacture of an antifungal agent.
41. The use of claim 40 wherein the antifungal agent is effective to inhibit the growth of *C. albicans*.
42. The use of the nonpolar extract of claim 26 in the manufacture of an insecticidal agent.
43. The use of the nonpolar extract of claim 26 in the manufacture of a cleansing agent.
44. The use of the nonpolar extract of claim 26 in the manufacture of a disinfecting agent.
45. A preservative composition comprising the polar extract of claim 25.
46. An antioxidant composition comprising the polar extract of claim 25.
47. A cleansing agent comprising the polar extract of claim 25.
48. A disinfecting composition comprising the polar extract of claim 25.

-41-

49. The lignin extract of claim 6.
50. The use of the lignin extract of claim 6 in the manufacture of an antioxidant.
51. The use of the extracted plant materials of claim 27 for the construction of wood products.
52. The tropolone extract of claim 6.
53. A preservative composition comprising the tropolone extract of claim 6.
54. A cleansing agent comprising the tropolone extract of claim 6.
55. A disinfecting composition comprising the tropolone extract of claim 6.
56. An antifungal composition comprising the tropolone extract of claim 6.
57. An insecticidal composition comprising the tropolone extract of claim 6.
58. An antibacterial composition comprising the tropolone extract of claim 6.
59. The use of the tropolone extract of claim 6 in the manufacture of a medicament for treating infection.
60. The use of the tropolone extract of claim 6 in the manufacture of a disinfectant.
61. The use of the tropolone extract of claim 6 in the manufacture of a fragrance.
62. The use of the tropolone extract of claim 6 in the manufacture of an antibacterial agent.
63. The use of the tropolone extract of claim 6 in the manufacture of an anticancer agent.
64. The use of the tropolone extract of claim 6 in the manufacture of an antifungal agent.

-42-

65. The use of the tropolone extract of claim 6 in the manufacture of an insecticidal agent.